

REMARKS

Claims 1-8 are currently pending in this application, as amended. By the present amendment, claims 1, 3 and 5 have been amended. Applicant respectfully submits that no new matter has been introduced into the application by these amendments.

CLAIM OBJECTIONS

In the Action, claims 1-8 were objected to due to a minor formality in claim 1. This has been corrected as suggested in the Action. Accordingly, withdrawal of the objection to the claims is respectfully requested.

ALLOWABLE SUBJECT MATTER

In the Action, it was indicated that claims 3, 5, and 8 were only objected to as being dependent upon a rejected base claim and would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

In response, claims 3 and 5 have been rewritten in independent form to include all the limitations of claim 1. Accordingly, claims 3 and 5 should now be in condition for allowance. As claim 8 depends from claim 5, it should be similarly allowable.

CLAIM REJECTIONS – 35 U.S.C. §103

Claim 1, 2, 4, 6 and 7 were rejected under 35 U.S.C. §103 as unpatentable over the combination of U.S. 3,947,156 to Becker and U.S. 5,349,846 to Delaney et al. Becker is cited as disclosing a diaphragm pump. Delaney et al. is cited as teaching the diaphragm pump having a working diaphragm with a lower side of the diaphragm connected to a pump rod with the diaphragm having a stiffened area

between inner and outer annular zones with the stiffened area being stiffened by straight radial support ribs. Applicant respectfully traverses this rejection.

Claim 1 is directed to a diaphragm pump which includes a working diaphragm that is a so-called molded membrane that oscillates between a bottom dead center and a top dead center position. A pump chamber is defined between the working diaphragm and a pump chamber wall. The diaphragm rests against the pump chamber wall in the top dead center position. The working diaphragm has inner and outer annular zones which are deformable during the pumping movements and includes a stiffened diaphragm area that is generally non-deformable during the pumping movements that is arranged between the deformable annular zones. The diaphragm is stiffened in the stiffened diaphragm area by support ribs which are oriented in a radial direction and are spaced apart from each other in a circumferential direction and which are arranged on a lower side of the diaphragm facing away from the pump chamber wall.

There is no question with respect to the teachings of Becker '156 (the inventor's prior patent) as showing a diaphragm pump having a working diaphragm. However, contrary to the present invention the working diaphragm of Becker '156 does not include inner and outer annular zones which are deformable during pumping movements along with a generally non-deformable stiffened diaphragm area located between the inner and outer annular zones.

Delaney et al. discloses a pump diaphragm having a hole (12) through the center thereof. Pistons (31, 32) are located on a piston rod (30) that extends through this central hole (12) in the diaphragm. Based on this arrangement, it is clear that the diaphragm of Delaney et al. cannot rest against a pump chamber wall in the top dead center position as required in claim 1 due to the pistons on either side of the hole. Additionally, Delaney et al. specifically notes that the ribs provided on its diaphragm extend across a generally annular flexure portion of the

diaphragm from near the center to near the outer perimeter. See column 1, lines 55-60. These ribs are said to increase diaphragm life by preventing radial cracking in the diaphragm. It is clear from a review of Figures 2, 3a and 3b that these ribs (13) of Delaney et al. are intended to flex with the diaphragm as it is moved. Compare in particular, Figures 3a and 3b. Accordingly, there is no suggestion or teaching in Delaney et al. of a generally non-deformable stiffened diaphragm area having support ribs that prevent this stiffened diaphragm area from flexing as in the present invention. Rather than providing two hinged zones on either side of a non-flexible portion, the diaphragm provided by Delaney et al. is clearly flexible across its entire radial extent.

Additionally, Delaney et al. specifically recites that the ribs are located either on the convex side or both sides of the diaphragm. See in particular column 2, lines 42-43. In the present case, it is required that the ribs are arranged on a lower side of the diaphragm facing away from the pump chamber wall (i.e. the concave side) in order to allow the upper side of the diaphragm to rest against the pump chamber wall in the top dead center position as required in claim 1.

In view of the foregoing, even if Becker '156 were to be combined with Delaney et al., this would still not suggest or disclose each of the elements recited in claim 1. Accordingly, withdrawal of the Section 103 rejection of claim 1 is respectfully requested.

Claims 2, 4, 6, and 7 depend from claim 1 and should be similarly patentable for the reasons noted above in connection with claim 1.

CONCLUSION

If the Examiner believes that any additional minor formal matters need to be addressed in order to place the present application in condition for allowance, the

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Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing Amendments and Remarks, applicant respectfully submits that the present invention, including claims 1-8, is in condition for allowance, and a Notice that the effect is respectfully requested.

Respectfully submitted,

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